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THE CENTRAL AFRICAN JOURNAL OF MEDICINE

ORIGINAL ARTICLES

Neoplasms involving the spinal cord in Zimbabweans: an analysis of 262 cases

PI GARRIDO, S LAHER-MOONCEY,
NL MURPHREE, N JONKER, LF LEVY,
S MAKARAWO

SUMMARY

A review of 262 histologically verified spinal cord tumours in Black Zimbabweans who were operated on in Harare Central and Parirenyatwa Hospitals, Harare, Zimbabwe during the period 1st January 1972 to 31st December 1991 is presented.

Fifty one pc of the neoplasms were found in the thoracic region, 53,4 pc were found extradurally, and of these the majority were metastatic (52 pc) and malignant tumours (85 pc). Most (96 pc) intradural-extramedullary tumours were benign with Schwannomas as the largest group (54 pc). Malignant astrocytomas presented as 71,4 pc of all intramedullary tumours. Metastatic tumours represented 28,6 pc of all spinal cord tumours. The most common sites of metastasis were from liver, thyroid and prostate.

INTRODUCTION

The objective of the study was to review the demography of neoplasms involving the spinal cord in Zimbabweans and to compare the results with other studies from Africa and elsewhere.

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MATERIALS AND METHODS

This review was based on the records of patients with histologically confirmed neoplasms involving the spinal cord seen in the neurosurgical units at Harare Central and Parirenyatwa Hospitals, Harare, Zimbabwe between 1st January 1972 and 31st December 1991. All of the patients presenting in this review were Black Zimbabweans.

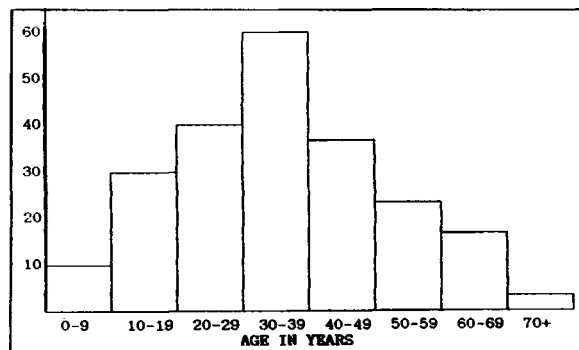
RESULTS

In 20 years there were 262 histologically confirmed tumours involving the spinal cord; 153 in males, 105 in females giving a male to female ratio of 1,5:1 (four subjects did not have the sex specified).

The peak number of cases occurred in the fifth decade of life. A comparison is made with the population age distribution of the country, using the 1982 Government Census. (Figure 1), and this shows that the prevalence rises with age.

Fifty one pc of the neoplasms were located in the thoracic region, 21 pc in the cervical region and 19 pc in the lumbar region. Nine pc did not have the site along the spinal cord specified.

Figure 1: Age distribution of patients compared with the age distribution of the population.



The tumours were classified by location within the spinal canal (extradural; intradural-extramedullary; intramedullary) and also by histological structure (Table I).

Table I: Histological classification by site within the spinal canal.

(a) Extradural – Total 140; 53,4 pc.			
Benign (21)		Malignant (119)	
		Secondary	
Haemangiomas	6	Metastatic tumours	73
		Primary	
Schwannomas	4	Lymphomas	24
Meningiomas	4	Myelomas	12
Osteoblastoma	2	+Sarcomas	5
Leiomyoma	1	Leukaemia	1
Aneurysmal bone cyst	1	Malignant schwannoma	1
Lipoma	1	Undifferentiated	3
Angiolipoma	1		
Spinal giant cell synovitis	1		

+These were considered as primary sarcomas. Three other sarcomas are classified with the metastatic tumours – see Table II).

(b) Intradural-extramedullary – Total 77; 29,4 pc.			
Benign (74)		Malignant (3)	
		Primary	
Schwannomas	40	Neurofibrosarcomas	2
		Secondary	
Meningiomas	27	Metastatic	1
Haemangiomas	3		
Lipomas	2		
Dermoid cyst	1		
Angiolipoma	1		

(c) Intramedullary – Total 35; 13,4 pc.			
Benign (6)		Malignant (29)	
		Primary	
Schwannomas	2	*Astrocytomas	25
Cysts	2	Ependymomas	2
Angioma	1	Teratoma	1
		Secondary	
Lipoma	1	Metastatic	1

*Includes two that were classified as glioblastomas because of a high degree of malignancy).

(d) Unclassified as to site – Total 10; 3,6 pc.	
Haemangiomas	5
Lipomas	2
Angiofibrolipoma	1
Angiosarcoma	1
Angiolipoma	1

DISCUSSION

1. Sex preponderance.

This study correlates with various others in sex incidence, suggesting that spinal cord tumours are more prevalent in males than in females.^{1,2,3}

Sex ratio	Male	:	Female
Zimbabwe (Garrido)	1,5	:	1
Kenya (Ruberti)	2.0	:	1
Nigeria (Odeku)	2,6	:	1

2. Age distribution.

The age incidence seems to vary in different countries. The peak number of cases in Zimbabwe was in the fifth decade, possibly because of the large number of metastatic tumours. However, if the percentage of cases in each group is compared with the distribution of the population at large, the incidence is highest in the sixth decade followed by the fifth and then the seventh decade (Figure 1). The Nigerian study has two peaks – the first and fifth decade. They attribute the peak in the first decade to a predominance of Burkitt's lymphoma, a tumour which is less common in Zimbabwe.⁴ By contrast, the Kenyan study shows a peak in the second and third decades.²

3. Frequency by site.

Along the spinal column.

	Egypt Sorour ⁵ pc	Kenya Ruberti ² pc	Lombardi & Passerini ⁶ pc	Zimbabwe Garrido pc
Cervical	11	38	17,3	21
Thoracic	60	54	64,2	51
Lumbar	20	8	18,5	19

The frequency of tumours at various levels along the spinal column is greatest in the thoracic region and correlates with other studies. According to Slooff *et al*³ this is to be expected if the frequency of tumours is proportional to the length of the segment. He gave the lengths as follows:- cervical 10 cm, thoracic 26 cm and lumbar 8,5 cm. However, whether the length of the column rather than the proximity or anatomical connection to affected organs or primary site of metastasis is the most relevant factor, is uncertain.

Within the spinal canal

	Nigeria Odeku ⁴ pc	Egypt Sorour ⁵ pc	Kenya Ruberti ¹ pc	Lombardi & Passerini ⁶ pc	Zimbabwe Garrido pc
Extradural	80,3	39,2	35,5	17	53,4
Intradural extramedullary	9,09	45,4	45,2	57	29,4
Intramedullary	6,06	15	19,3	15	13,4

The incidence of extradural tumours in our study was 53,4 pc – a higher percentage than in other studies apart from Nigeria as reported by Odeku *et al.*⁴ This again is a reflection of the high number of metastatic tumours which are predominantly found extradurally. Consequently, the relative incidence of intradural-extramedullary tumours was lower than most other studies although the histological types of tumours were the same i.e. Schannomas and meningiomas.⁷ The incidence of intramedullary tumours coincides more or less with other studies.

4. Histological variance by site (Table 1a).

Extradural neoplasms.

The majority (85 pc) of the extradural neoplasms (140) were malignant. Of the malignant tumours 64 pc were metastatic and 36 were primary tumours. Lymphomas (17 pc) and myeloma (8,5 pc) were the most common primary malignant tumours.

Haemangiomas (4,3 pc) were the most common benign extradural tumour. The origin of metastatic tumours is discussed later.

Intradural-extramedullary neoplasms (Table 1b).

The vast majority of these were benign (96 pc). Schwannomas accounted for 52 pc of these tumours and meningiomas for 35 pc. There was only one metastatic tumour. The remainder therefore were primary tumours.

Intramedullary neoplasms (Table 1c).

Again there was only one metastatic tumour with the majority of these neoplasms being primary tumours. However, the malignancies (83 pc) exceeded the benign (17 pc) by almost five to one.

Astrocytomas (71,4 pc) represented the majority of intramedullary tumours. Ependymomas (5,7 pc) occurred considerably less frequently here as compared with other studies.^{1,3,5,7}

5. Metastatic tumours (Table II).

In our study 75 (28,6 pc) of all neoplasms were metastatic and 187 (71,4 pc) were primary tumours.

This is comparable with the studies done in Kenya² (Ruberti *et al*) and Nigeria⁴ (Odeku *et al*), but is vastly different from the Egyptian study⁵ (Sorour *et al*) where metastatic tumours accounted for only 4,6 pc of all spinal cord tumours.

Table II: Classification of metastasis to the spinal cord by primary site.

a) Carcinomas – Total 65 (86 pc of metastatic tumours).

Liver	12
Thyroid	9
Prostate	9
Bronchus	6
Gastro-intestinal	3
Bladder	2
Nasopharynx	1
Pancreas	1
Breast	1
Skin	1
Parotid	1
Unknown origin	19

b) Sarcomas – Total 3 (4 pc).

Angiosarcoma (one from hand, the other from unknown origin)	2
Leiomyosarcoma (origin unknown)	1

c) Melanomas – Total 2 (3 pc)

(origins unknown, possibly primary)

d) Neuroblastomas – Total 2 (3 pc).

(origins unknown)

e) Unclassified metastatic tumours – Total 3 (4 pc).

Clearly the incidence is affected amongst other things, by surgical opinion relating to the indications for operative intervention.

In Zimbabwe metastases to the spinal cord originated mainly in tumours of the liver, thyroid and prostate. These respectively represent the fourth, eleventh and sixth most common cancers in Blacks in

Zimbabwe⁹ and this may therefore explain the high incidence of metastasis. This contrasts with other series^{3,8} (Figure II), in which the main source of metastasis were the lung, breast, kidney and prostate.

Figure II: The four most frequent carcinomatous metastases of the spinal column – different studies.

	Egypt Sorour ⁶	Kenya Ruberti ²	Nigeria Odeku ⁴	Zimbabwe Garrido
Ependymoma	3,8	–	1,5	0,8
Astrocytoma	6,2	19,4	–	9,5
Meningioma	21,5	9,7	6,1	11,8
Schwannoma	21,5	32,3	4,5	17,9
Metastatic Tumours	4,6	35,5	31,8	28,6
Lymphomas	–	–	28,8	9,1
Multiple Myeloma	–	–	3,0	4,6
Haemangiomas	–	–	1,5	5,7

Table III: Histological comparison of some of the main types of tumours in various series (percentage of total tumours).

	Egypt Sorour ⁶	Kenya Ruberti ²	Nigeria Odeku ⁴	Zimbabwe Garrido
Ependymoma	3,8	–	1,5	0,8
Astrocytoma	6,2	19,4	–	9,5
Meningioma	21,5	9,7	6,1	11,8
Schwannoma	21,5	32,3	4,5	17,9
Metastatic tumours	4,6	35,5	31,8	28,6
Lymphomas	–	–	28,8	9,1
Multiple myeloma	–	–	3,0	4,6
Haemangiomas	1,2	–	1,5	5,7

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